



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Ai Kondo	Examiner: Sanza L. McClendon
Serial No. 10/623,872	Art Unit: 1711
Filed: July 21, 2003	
Title: Curable White Ink	

Commissioner for Patents  
USPTO  
P.O. Box 1450  
Alexandria, VA 22313-1450

## DECLARATION

I, Satoshi Masumi, hereby declare as follows:

I received a master's degree in chemistry from Osaka University in March of 1989. Since April of that year, I have been employed by Konica Corporation (now Konica Minolta Medical and Graphic, Inc.), the assignee of the above-referenced application, and have been engaged in research and development in the field of color photographic materials and ink-jet recording materials.

I personally conducted the following experiments in order to show the unexpected superior effects obtained by using a white pigment having an average particle size of 0.1 to 1.0  $\mu\text{m}$ .

White Pigment Dispersions 1x, 1y, and 1z were prepared in the same manner as the preparation method of White Pigment Dispersion 1 described in page 44, lines 11-23, of the specification as filed, except that:

White Pigment Dispersion 1x contains titanium oxide having an average particle

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diameter of 0.04  $\mu\text{m}$  instead of titanium oxide having an average particle diameter of 0.15  $\mu\text{m}$ ;

White Pigment Dispersion 1y contains titanium oxide having an average particle diameter of 1.2  $\mu\text{m}$  instead of titanium oxide adding an average particle diameter of a 1.0  $\mu\text{m}$ ; and

White Pigment Dispersion 1z contains titanium oxide having an average particle diameter of 0.9  $\mu\text{m}$  instead of 1.0  $\mu\text{m}$ .

Afterwards, Ink Compositions 1X, 1Y, and 1Z were prepared in the same manner as the preparation method of Ink Composition 1 described on page 45, line 11 to page 46, line 5, of the specification as filed, except that:

Ink Composition 1X contains White Pigment Dispersion 1x instead of White Pigment Dispersion 1;

Ink Composition 1Y contains White Pigment Dispersion 1y instead of White Pigment Dispersion 1; and

Ink Composition 1Z contains White Pigment Dispersion 1z instead of White Pigment Dispersion 1.

Thus prepared, Ink Compositions 1X, 1Y, and 1Z were evaluated in the same manner as was Ink Composition 1 in the specification. This evaluation method is described on page 50 to page 51 of the specification. The evaluation results are shown below:

#### **Evaluation Results:**

##### **<Ink Composition 1X>**

(1) When ink-jet printing was done on an OPS substrate, the ink covering properties were found to be very low.

(2) When ink-jet printing was done on a black plastic substrate, the visibility was too low for practical use.

**<Ink Composition 1Y>**

(1) When Ink Composition 1Y was loaded on an ink-jet head, the head nozzles suffered clogging. As a result, stable jetting of the ink was not achieved by Ink Composition 1Y.

**<Ink Composition 1Z>**

(1) Ink-jet printing was done on a recording media of a 50  $\mu\text{m}$  thick transparent shrink PET (polyethylene terephthalate) substrate. After ejection, UV irradiation was carried out in an amount of the total exposure energy equal to  $160 \text{ mJ/cm}^2$ . As a result, it was possible to form white images and white text, which resulted in excellent adhesion to the substrate and good durability. However, a small number of satellite ink drops arrived at the substrate surface later than the primary ink drops. This slightly deteriorated the quality of the obtained image, but the quality is still acceptable for practical use.

(2) Ink-jet printing was done on recording media: an OPS substrate and a circuit board. The visibility on each substrate was found to be sufficiently high for practical use.

**Declaration**

I hereby declare that all statements made herein of my own knowledge are true and that all statements made upon information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Executed on this April 28, 2005.

By: Satoshi Masumi  
Satoshi Masumi